

REVIEW

The Scrophulariaceae of Eastern Temperate North America. By FRANCIS W. PENNELL. Monographs of the Academy of Natural Sciences of Philadelphia, Number 1. Pp. xiv + 650, with 43 figures and 155 distributional maps. Philadelphia, November, 1935. \$5.00.

The present volume may be generally acclaimed as the most important contribution that has appeared on the Scrophulariaceae since the researches of George Bentham culminated in his classical treatment of the family in De Candolle's "Prodromus" in 1846. One realizes upon studying the present paper that Pennell not only possesses an intimate knowledge of the Scrophulariaceae, but he uses that knowledge most logically in arriving at sound phylogenetic conclusions. His handling of the various units displays a complete familiarity with their characteristics and a keen intuition for their past history.

This work is intended to include every species of Scrophulariaceae growing between the Laurentian Divide and the Gulf of Mexico, and between the Atlantic Ocean and the eastern base of the Rocky Mountains, an area sufficiently vast to number among its 51 genera and 218 included species representatives of about 75 per cent of the generally accepted tribes that compose the family. On the basis of their study, Pennell draws up a new phylogenetic classification for the Scrophulariaceae as represented in this area.

The masterly work of Bentham has tempted little criticism in the 90 years subsequent to its appearance, and later accounts have left it fundamentally unchanged. Still, it dates from pre-Darwinian times and takes no account of the evolutionary development of the group. Pennell attempts a reclassification from the phylogenetic viewpoint for which there is ample material in the great diversity of floral structure in the family. The resulting rearrangement is a stimulating endeavor that makes one regret the whole family could not have been so treated. Many innovations will be found, and it appears to the reviewer that doubtless the majority of these should be universally acceptable. Only a few points can be mentioned. His first distinction in formulating a new classification within the family is between the subfamilies Antirrhinoideae and Rhinanthoideae, which may be distinguished by the relative positions of the corolla-lobes. In seeking the most primitive tribe within the first subfamily, Pennell disputes the long held hypothesis that *Verbascum* represents the logical connecting link between Scrophulariaceae and the actinomorphic family Solanaceae; and because he believes *Verbascum*, with its five stamens and only slightly zygomorphic corolla, has been derived from a bilabiate type with didynamous stamens, he transfers the tribe Verbasceae to a more advanced position. Instead, a tribe with usually open-throated zygo-

morphic corolla and didynamous stamens, the Gratioleae, is accorded the primitive position, of which, on this coast, *Mimulus* is the most common example. At the apex of evolution for the second subfamily, Rhinanthoideae, Pennell follows Bentham in placing the tribe Euphrasiae. Within that tribe, however, *Orthocarpus* and *Castilleja* are advanced to final positions ahead of *Pedicularis* and *Melampyrum*, a position the relative complexities of their calyx and corolla would seem to warrant. Two western genera, *Collinsia* and *Tonella*, constitute a new tribe, Collinsieae, carved from the Cheloneae as circumscribed by Bentham. The tribe Digitaleae has had all but two genera removed from it to form the Veroniceae.

Throughout this study especial importance has been attached to the effect of floral structure on pollination or vice versa, and the evolutionary value of diverse methods of pollination.

One finds in the introduction an important discussion of species- and genus-concept in addition to detailed information on taxonomic methods, distribution and phylogeny.

The body of the paper consists of the systematic account. Analytical keys are sufficiently detailed to cover the lack of specific descriptions, only the new units being described in full. Color notes have been given quite fully in the discussion accompanying each species. Pennell is a master at elucidating the nomenclatural tangles that accompany abundant synonymy, and this reviewer is pleased that such an important phase of descriptive botany has received detailed attention. At times the author prefers to set his own standard above the International Rules, a practice that will be frowned upon by those who feel conformity leading to uniformity is a greater desideratum at present than innovations seeming to have greater logic in their favor. His subspecies are written as trinomials, a practice that invites misinterpretation. But Pennell gives in full a reason for each change, so one finds it easy to evaluate the merits of his work. "The synonymy is restricted to original descriptions and combinations appearing in recent literature, thus failing to record many other combinations deemed not essential to present nomenclature." This omission is unfortunate in a work otherwise so complete. The reviewer finds some 23 synonyms omitted from the account of *Penstemon*, for example.

Practically every species that occurs within the area has an accompanying distributional map. This most important feature shows at a glance where the species occurs, whether its distribution is the expected or erratic, and, on many maps, how the distribution of the species coincides with such geologic features as the limits of Pleistocene glaciation. Each native species within the area of the paper is considered over its entire range in temperate North America. Accordingly, many Pacific Coast species are mapped and cited in full. The citation of specimens

is vast, some 25,000 herbarium specimens of the 40,000 examined being listed! The collections in 88 herbaria were studied, a thoroughness unduplicated in American botany.

Pacific Coast botanists will find changes in the names or status of some of their species of *Gratiola*, *Lindernia* (*Ilysanthes*), *Scrophularia*, *Linaria*, and *Veronica*.

A valuable third portion of the volume concerns the distribution of the flora of eastern North America, as illustrated by the Scrophulariaceae. The geographical and geological factors are considered in view of the information given in the detailed maps of distribution, and much original data of import to plant geographers is presented.

Dr. J. H. Barnhart aided Dr. Pennell in compiling the included list of over 1,000 complete names of persons whose collections within the area have been of most importance, with data as to their years of life, the states where they have been most active, and the depositories in which their material is best represented.

All students of systematic botany will find this a model of excellence for style and attention to detail, and specialists may to advantage gain a fresh understanding of this important family from a perusal of its pages.—DAVID D. KECK.

NOTES AND NEWS

While on a field trip in the vicinity of Piñon (Vallecito) Mountain in eastern San Diego County, January 1-3, 1936, a group from the Department of Biology of San Diego State College noted the occurrence of *Calliandra eriophylla* Benth., a plant which previously has been recorded from only one locality in California: near Ogilby, eastern Imperial County. The colony, discovered by Miss Florence Youngberg as the party was descending Piñon Mountain, is on the south side of the mountain, about one-half mile from the camp at the cave in Upper Blair Valley. It was estimated that the colony covers an area of about fifty acres with one plant to about every two hundred square feet. On the dry slope most of the plants were about one foot in height, while those in the wash were up to two feet in height and were in leaf, flower, and fruit. Other plants found in the same region were *Bernardia myricaefolia*, *Thamnosma montana*, and *Acacia Greggii*.

Dr. Jens Clausen, Carnegie Institution of Washington at Stanford University, has been elected Honorary Fellow by the Botanical Society of Edinburgh.

Due to the long delay in the appearance of the revised edition of Piper and Beattie, "Flora of Southeastern Washington and Adjacent Idaho," the original 1914 edition has been